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## **Distributed Probabilistic Learning for Camera Networks**

by

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## Abstract

Probabilistic approaches to computer vision typically assume a centralized setting, with the algorithm granted access to all observed data points. However, many problems in wide-area surveillance can benefit from distributed modeling, either because of physical or computations constraints. In this work we present an approach to estimation and learning of generative probabilistic models in a distributed context. In particular, we show how traditional centralized models, such as probabilistic principal component analysis (PPCA), can be learned when the data is distributed across a network of sensors. We demonstrate the utility of this approach on the problem of distributed affine structure from motion (SfM). Our experiments suggest that the accuracy of the learned probabilistic structure and motion models rivals that of traditional centralized factorization methods.